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Reflection on the use of mobile phones for monitoring gender indicators related to climate-smart agriculture practices

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María Alejandra García
Natalie Orentlicher
Jennifer Twyman
Anton Eitzinger
Osana Bonilla

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Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture
Km 17 Recta Cali–Palmira CP 763537
Apartado Aéreo 6713
Cali, Colombia
Phone: +57 2 4450000
Website: www.ciat.cgiar.org

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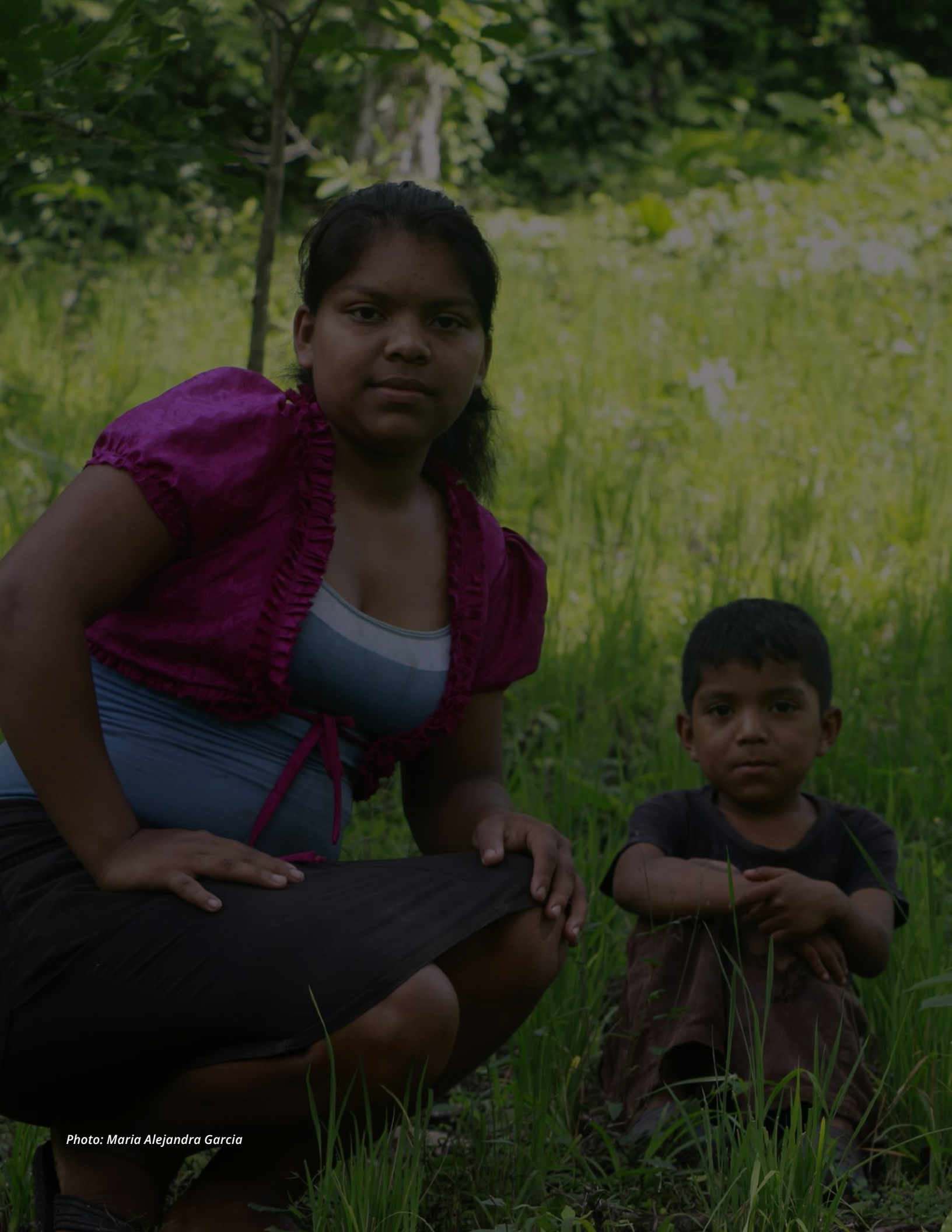

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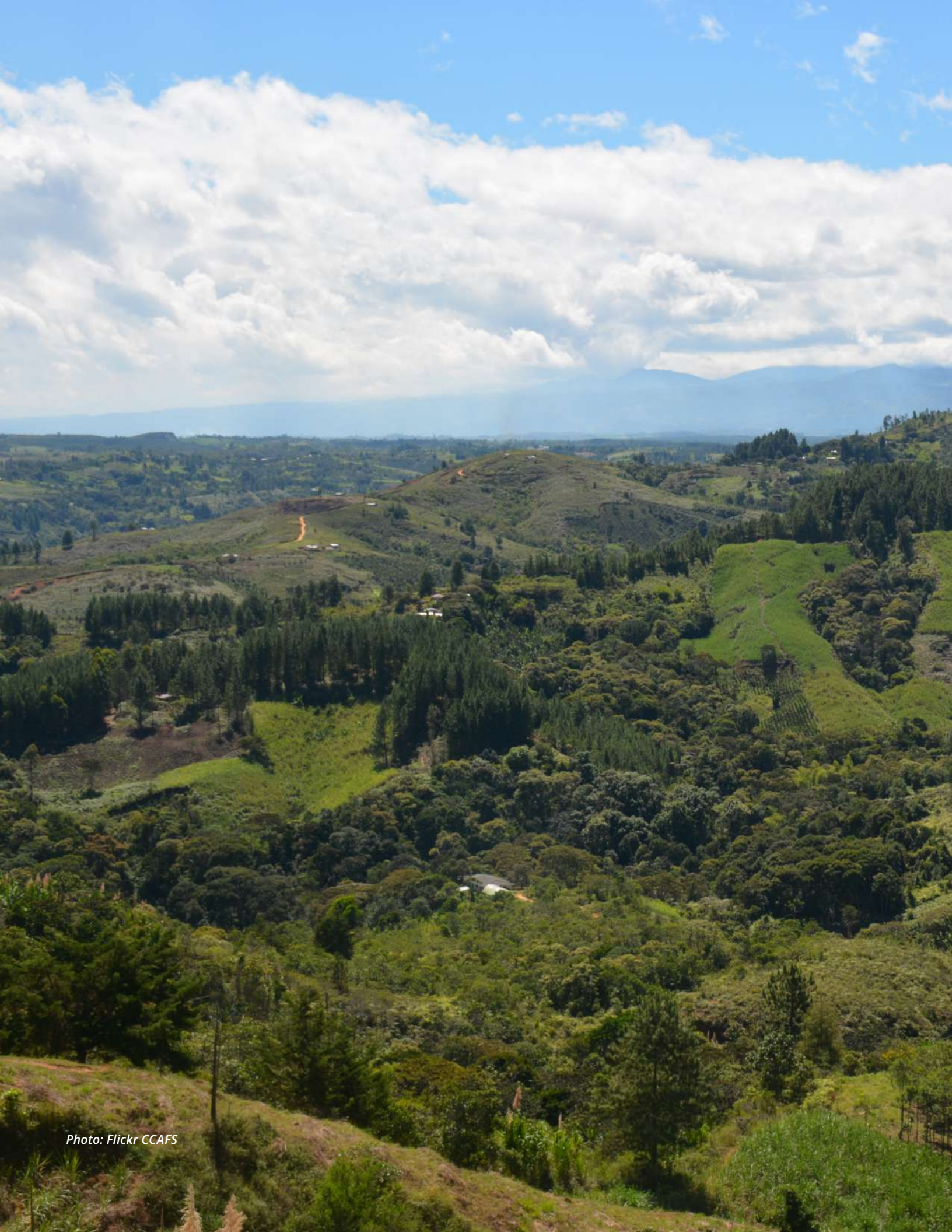

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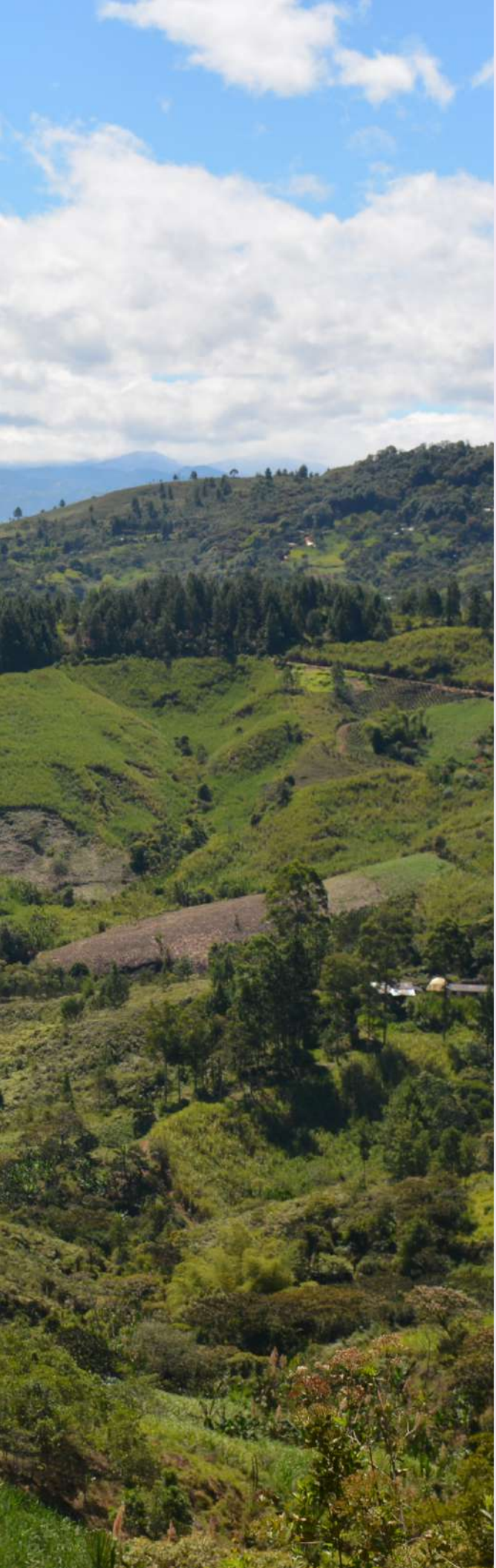


Abstract

Monitoring and Learning (M&L) systems are increasingly being requested to measure gender indicators in the context of agricultural interventions. This study reflects on the feasibility of using cellphones to collect data for monitoring gender indicators related to the adoption of climate-smart agricultural practices through call-based surveys. The study was conducted in the context of the development of an M&L system for the CGIAR Research Program on Climate Change, Agriculture, and Food Security. In this case, the approach is used to understand if and how a climate smart agriculture practice impacts the gender division of labor, control over resources and benefits, and participation in decision-making. We reflect on the constraints and aspects that enable the development of monitoring gender indicators related with CSA practices. In our reflection, we identify five challenges related to survey design and sampling: choosing which indicators can be monitored, survey design and question wording, response rates of men and women, identifying respondents, and how cellphones impact sample selection. Each of these issues should be considered when using cellphones to monitor gender indicators in a development project.

KEY WORDS

MONITORING AND LEARNING
MOBILE PHONE
GENDER INDICATORS
CLIMATE SMART AGRICULTURE

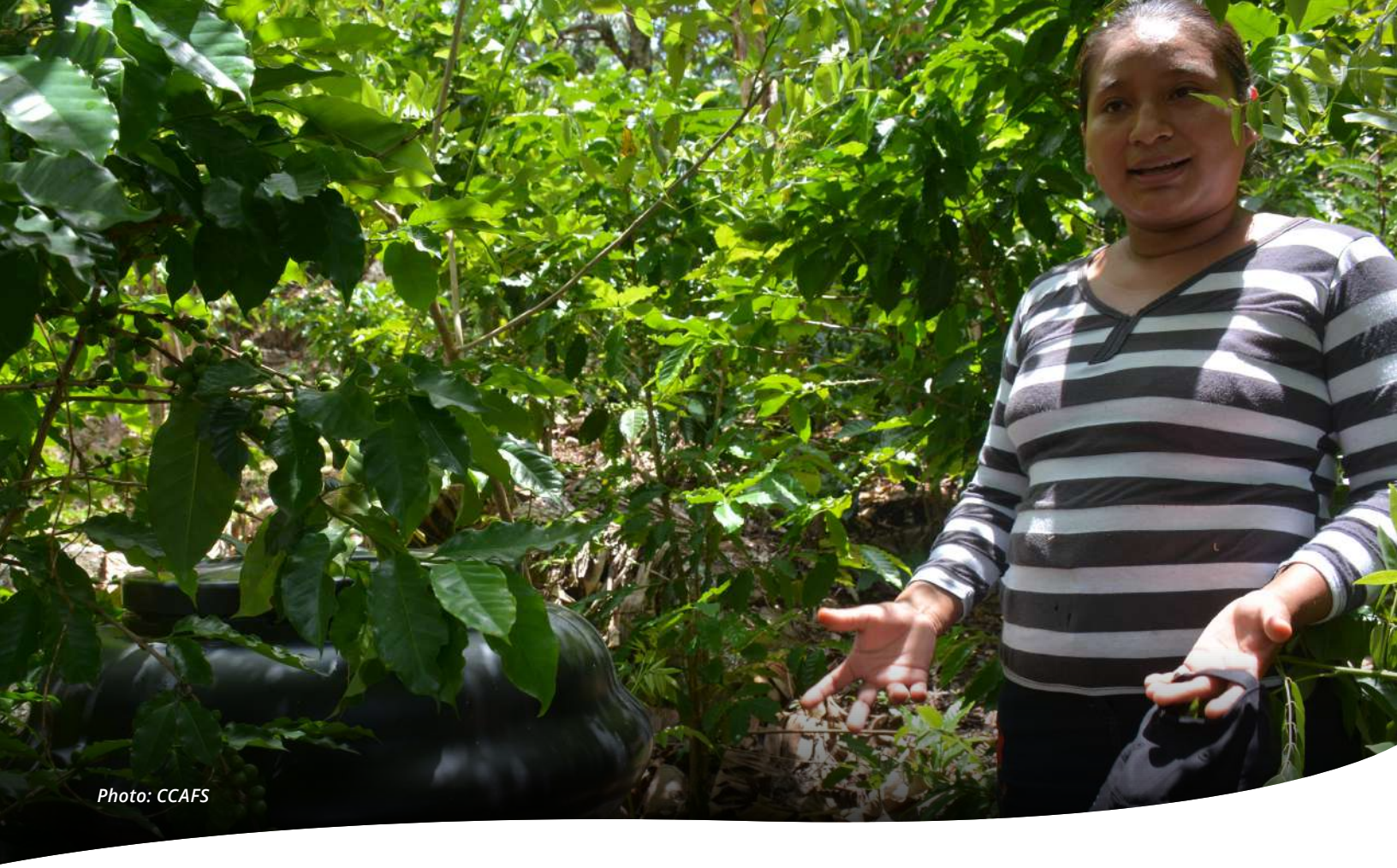


Photo: CCAFS

1 Introduction

Monitoring and learning (M&L)[1] systems are increasingly being requested to measure gender indicators within intervention contexts, including those within the field of agricultural development and climate change adaptation. There is a growing pressure to demonstrate results, since gender research is no longer solely a matter of social justice, but also an issue of investment (Batiwala 2011; Bowman & Sweetman 2014). Feminist and gender sensitive approaches have been designed and implemented in order to strengthen this research, either for projects that are considered gender-specific or for those that mainstream a gender perspective in order to accomplish their outcomes (Podems 2010). Usually, such gender project components have time, budget and geographical constraints. Flexible, inexpensive and rapid M&L systems are expected.

Previous research has highlighted the usefulness of Information and Communications Technologies (ICTs), such as mobile phones, for disseminating agro-climatic information (Aker et al. 2016; Deichmann et al. 2016; Dillon 2012; Dillon et al. 2015; Nakasone and Torero 2016) or for collecting socioeconomic information, at a lower cost and in less time than other methods (Aker et al. 2016; Dillon 2012; Dillon et al. 2015; Vogl 2013). But less is known about the usefulness and potential gender implications of using ICTs for collecting data from farmers. Recent studies have demonstrated the existence of gender bias in the use and benefits of mobile phones in rural and agricultural research and development projects. Women can have less access to and/or control over this ICT compared to men, since the use of mobile phones depends on intra-household power relations, gender roles and social differentiation (Aker et al. 2016; Burrell 2010; Dodson et al. 2013; Geldof 2011). Other experiences, however, have shown that mobile phones can be used as an enabler for women's empowerment and women's wellbeing outcomes in developing countries (Belalcázar 2015; Klonner and Nolen 2010; Mittal 2016).

Yet little is known about how mobile phones might be used as a research tool for collecting sex-disaggregated data and gender indicators in projects related to agriculture and climate change adaptation. In order to help fill this gap, in 2017 we reflected on the feasibility of using cellphones to collect data for monitoring gender indicators related to climate smart agricultural practices. This reflection was part of the first pilot test used for

the creation of the monitoring system being developed by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) for their climate-smart villages (CSVs) learning platform. In this pilot we assessed the gender dimensions of that system. Specifically we sought to understand if and how one selected climate smart agriculture (CSA) practice, the climate sustainable home garden,[2] impacts gendered division of labor, control over resources and benefits, and participation in decision-making. This paper describes our experiences on testing the use of cellphone-based automated calls for monitoring gender indicators, within the context of CSA agriculture, using the farmers' mobile phones as the main data collection tool. The results of this experience provide useful lessons learned for researchers interested in the use of ICTs for monitoring, evaluation and learning purposes. We expect this assessment to guide researchers and stakeholders who work within agriculture and climate change adaptation to better monitor gender indicators.

For the analysis, we consider the minimum standards of sex-disaggregated data collection. A principal component of sex-disaggregated data collection is that information about women's and men's contributions, opinions and needs should be collected from their own perspectives (Doss and Kieran 2013). This is important because studies report that there is a lack of spousal agreement about issues regarding the household and the farm (Alwang et al. 2017; Ambler et al. 2017; Weeratuge et al. 2016; Twyman et al. 2015).

[1] During the analysis we will use M&L rather than M&E (Monitoring and evaluation) or MEL (Monitoring, Evaluation and Learning), since the objective of the system that we pilot is to learn how the agricultural innovations are being used by the people rather than to evaluate or measure its impact.

[2] In the CSV, CCAFS, in conjunction with a local NGO, have promoted three types of sustainable home gardens: vertical, circular and horizontal. All have the use of water harvesting, irrigation and compost in common.

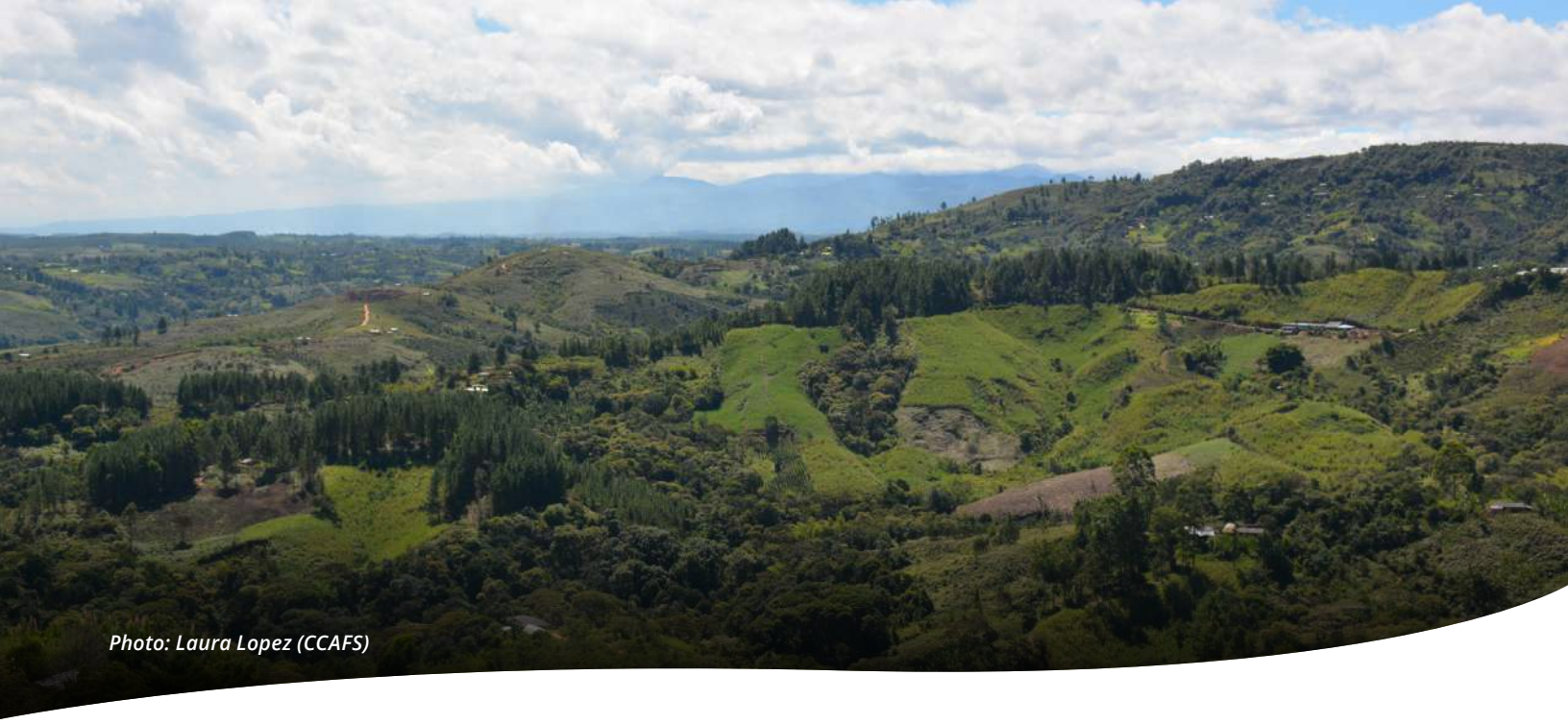


Photo: Laura Lopez (CCAFS)

2 Method

2.1 Site and villages of study

The study site is within the CCAFS CSV in Cauca, Colombia.[3] While the CSV site includes about 15 communities, data collection for piloting the M&L system was initially implemented in three of them, with a population of about 272 households. Within this site, CSA practices were identified by farmers for trial, including sustainable home gardens (our study's focus), improved bean varieties, water harvesting and new water management techniques.

Data from an intra-household baseline survey with 198 households from the 15 communities of the CSV in 2014 indicate that 65.7 % of the households are dual-headed, while 21.7% are single female-headed and 12.6% single male-headed. In terms of education, 93% of adults have finished at least primary and 28% at least secondary studies. The majority are smallholder farmers (with an average farm size of 1.3 hectares) that own their land and produce coffee, sugar cane and beans as primary cash crops. In terms of access to mobile phones, 90.4% of the households have mobile phones, with 54% of households owning just one mobile phone. Predominantly, women are reported as owners of the mobile phones (in 28.8% of households), but men or joint ownership by the couple is nearly as common (21.2% and 23.7% respectively) (Table 1). Finally, during implementation of the study, we noticed that mobile network access was not available in all of the study site.

Table 1 Mobile phone owner by household type (percentages)

MOBILE PHONE (S) OWNER (S)	DUAL HEADED-HOUSEHOLD (N=130)	SINGLE FEMALE HEADED-HOUSEHOLD (N=43)	SINGLE MALE HEADED HOUSEHOLD (N=25)	TOTAL HOUSEHOLDS IN THE CSV (N=198)
Principal man	23.08	-	48.00	21.21
Principal woman	26.92	51.16	-	28.79
Both, principal man and woman[1]	36.15	-	-	23.74
Neither principal man nor woman[2]	10.00	37.21	16.00	16.67
Household does not own a mobile phone	3.85	11.63	36.00	9.60
TOTAL	100.00	100.00	100.00	100.00

[3] More information of the CSV in Colombia can be found by the following link: https://ccafs.cgiar.org/csv-cauca-colombia#.WeJ0sVtSzIU

Source: Authors' calculations based off of the 2014 gender survey in the 15 villages of Cauca site, which can be found: CIAT; IFPRI, 2014, "CCAFS Gender Survey – Colombia Climate Smart Village", https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/28324

Notes:

[1] This includes households where there is joint ownership of one mobile phone by both spouses and/or households where there are more than one mobile phones owned by the spouses.

[2] Neither spouse owns the mobile phone but someone else in the household does.

2.2 Methodological techniques

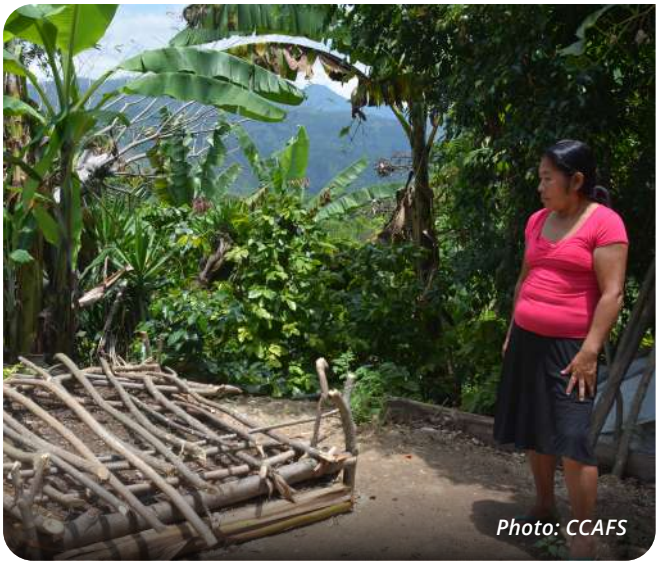
The reflection on the use of mobile phones was based on our experience in undertaking the pilot test of the M&L in the study site. Moreover, we conducted exploratory semi-structured interviews with farmers who were part of the population for the M&L system pilot test. We interviewed the principal man and/or woman of twelve households to gather information about their perception on using this kind of tool for monitoring. These households included both implementers and non-implementers of any CCAFS-promoted CSA practice, respondents and non-respondents of the mobile phone survey, and dual and single headed households. In total, we interviewed 9 men, between the ages of 41 and 85, and 11 women, between the ages of 27 and 80. The majority of the participants interviewed had a primary-level education, with some, especially the oldest members, not knowing how to read or write. We asked women and men separately about their opinions on the survey call, their limitations for answering the calls, and what they liked and did not like about the calls.

2.3 Description of the pilot test

The main objective of the project was to build a tracking system that could provide feedback to scientists, local partners and stakeholders on gendered benefits from and constraints to implementing CSA practices. We decided to build on the idea of the 5Q approach, since it is a monitoring and evaluation approach that aims to reach the beneficiaries or participants of a development project while minimizing costs and time. This approach is also characterized by the use of ICT, specifically mobile phones and interactive-voice-response (IVR) calls, to gather the information. "5Q" refers to five targeted and simple questions that concentrate on identifying what participants' "needs and perceptions of activities carried out within a project are and how a specific project can serve them" (Jarvis et al 2015: 3). After deciding on this approach to structure the survey questionnaire, we then employed the use of interactive-voice-response (IVR) calling platforms (in our case we use VIAMO) to record the 5Q survey in a series of calls, as well as to automatically execute the calls and gather the recorded responses.

As a first step of the pilot study, we established the objectives and gender indicators needed to respond to the program's needs. The main objective of the M&L system is to monitor the uptake of CSA practices in the site. In terms of gender, the objective is to identify and monitor gender-related issues of CSA practice uptake. Gender indicators related to access and control over resources, participation in decision-making, and the gender division of labor, were identified from the CCAFS Gender and Social Inclusion Strategy (Huyer et al. 2016) and the wider CGIAR Gender Strategy (CGIAR 2015). For this pilot study, we decided to monitor just one CSA practice, the sustainable home garden, which according to a local NGO was the most-used practice and was most expected to demonstrate observable gender differences. Second, we formulated the survey questions for each indicator, and then validated these with other researchers involved in the broader CCAFS monitoring project and with the local partners.

We then conducted four rounds of survey calls with five to seven questions each: three rounds for those households that use the sustainable home gardens and one for those which do not (each round had different questions). These calls were implemented on Fridays and Saturdays, days in which farmers usually go to the market, in order to take advantage of the stronger mobile network access there. Lastly, we identified those households that did not answer or finish the survey calls and performed in-person interviews with them in order to fully finish the surveys. Overall, 8 men and 11 women answered the survey.



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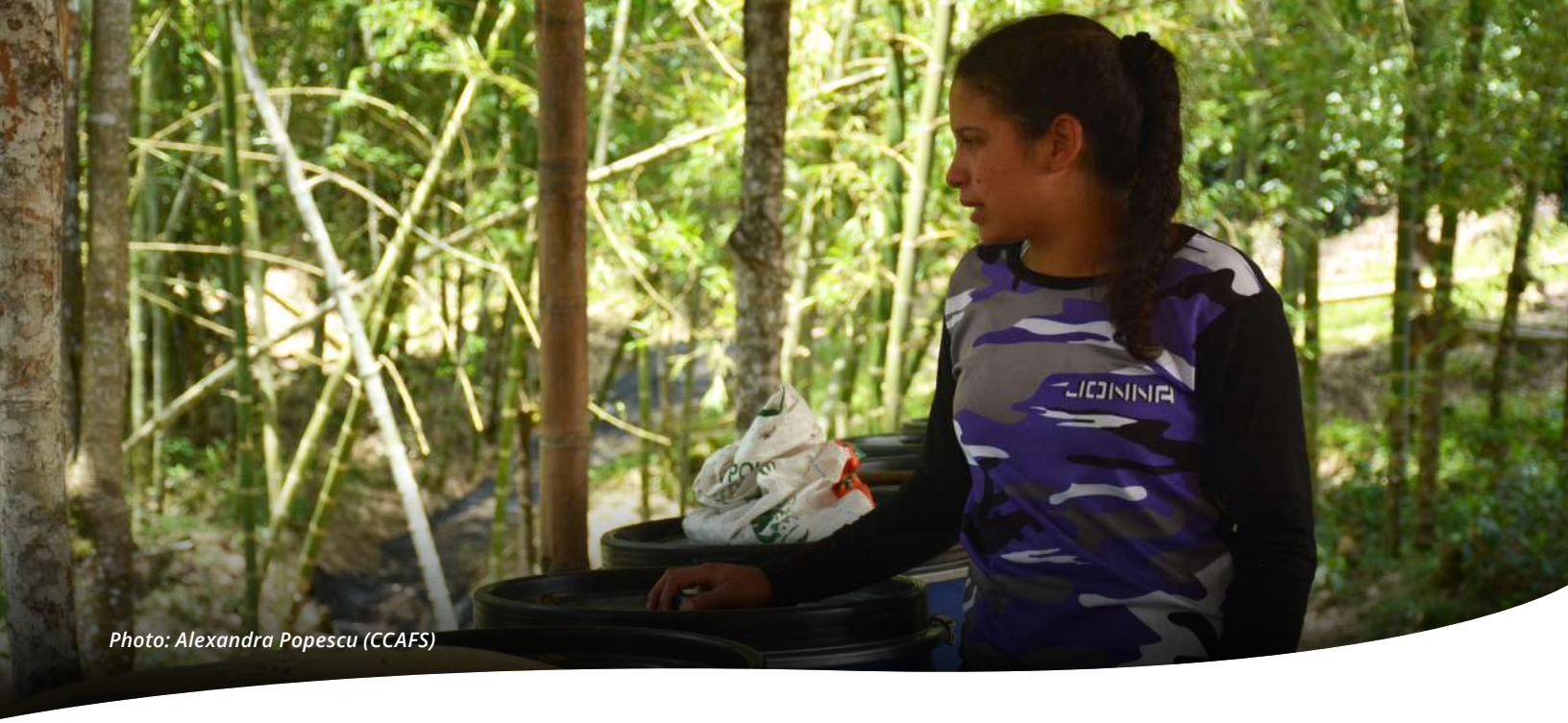


Photo: Alexandra Popescu (CCAFS)

3 Results

We identified five main challenges which influenced the tracking of gender indicators related to CSA practices through mobile phones and Interactive-Voice-Response (IVR) calls. The first two challenges are mainly related to the survey study design, such as setting the appropriate indicators and wording. The last three challenges revolve around full and equitable sampling obstacles, including the survey call response rates by gender, gendered practices and responses, and sampling gaps. In this section we describe the five challenges and provide recommendations for overcoming them. In section 4, we discuss the factors behind these challenges and how the challenges affect the monitoring study as a whole.

3.1 Challenge 1: Setting Appropriate Indicators

At the beginning of the M&L study, we proposed 30 different indicators that sought to achieve gender equality in five key areas of the project: participation in household and agricultural decision-making, control over economic resources (e.g. income), time use for agricultural activities, benefits from CSA practices, and targeting of agricultural innovations. The M&L system is designed to study these indicators across three different types of groups: a) current users of the CSA practice, b) previous users of the CSA practice, and c) non-users that have never tried the practice. However, because the implementation of the CSA practice is fairly new, previous users (group b), do not yet exist. Thus, this study/reflection focuses only on groups a) and c).

Table 2 lists the 30 indicators. In the table these indicators are divided in three groups: originally proposed for the survey and dropped, the ones that were piloted and at end dropped, and the ones that were piloted and were the most comprehensible. Eighteen of the original 30 gender indicators were dropped in the initial project stage while prioritizing indicators based on suggestions from experts on using mobile phones for M&E and the need to minimize the amount of information put into the M&L system. These 18 questions were dropped because they were too complicated to answer easily by mobile phone survey. As shown in Table 2, after ruling out such indicators, we tested 10 of the remaining 12 indicators. Two of the 12 were not tested because they correspond only to the group of previous users which does not yet exist. Of the 10 we tested, two were not comprehensible because they were also too complex to be understood by voice recording on a mobile phone call without additional explanation.

Table 2 Goals and objectives proposed, tested and recommended for monitoring CSA practices (cells highlighted in grey are those that are the more comprehensible)

GOAL	M&E TRACKING OBJECTIVES	IMPLEMENTERS OF THE CSA PRACTICE	NON-IMPLEMENTERS WHO HAVE TRIED THE CSA PRACTICE	NON-IMPLEMENTERS WHO HAVE NEVER TRIED THE CSA PRACTICE
Gender equality in decision-making	Women's and men's participation in decision-making about CSA practice	Proposed, tested & comprehensible	Proposed	Proposed
	Women's and men's participation in decision-making being joint or individual	**Proposed & tested**	Proposed	
	Why women and men do not participate in decision-making about the CSA practice	**Proposed & tested**		
	Women's and men's participation in decision-making to not use the CSA practice		**Proposed & comprehensible**	Proposed
Gender equality in control over productive resources	Women's and men's access to resources needed to implement the CSA practice	**Proposed**	**Proposed**	Proposed
	Women's and men's control over the resources needed to implement the CSA practice	**Proposed**	**Proposed**	Proposed
	Women's and men's control over resources (i.e. benefits or income) generated by the CSA practice	Proposed, tested & comprehensible		
Understand how gendered labor requirements of the practice relates to its uptake/adoption	Women's and men's labor to implement the practice	Proposed, tested & comprehensible		
	Women's and men's perception of changes in labor due to the CSA practice	Proposed, tested & comprehensible	Proposed	Proposed
Gender equality in benefits from agricultural innovations	Why women and men implement in the practice	Proposed, tested & comprehensible		
	Women's and men's perception of the benefits from the CSA practice	Proposed, tested & comprehensible	Proposed	Proposed
	Women and men obtainment of benefits from the CSA practice	Proposed	Proposed	Proposed
	Other HH members obtainment of benefits from the CSA practice Proposed	Proposed		

GOAL	M&E TRACKING OBJECTIVES	IMPLEMENTERS OF THE CSA PRACTICE	NON-IMPLEMENTERS WHO HAVE TRIED THE CSA PRACTICE	NON-IMPLEMENTERS WHO HAVE NEVER TRIED THE CSA PRACTICE
Gender-equitable targeting of agricultural innovations	Women's and men's knowledge, skills and interest in the CSA	Proposed, tested & comprehensible		Proposed, tested & comprehensible
	Reason why women and men stop using the CSA practice		**Proposed, tested & comprehensible**	

Overall, we found 10 gender indicators to be the most comprehensible: 7 for users of the practice, 2 for those who have stopped using the practice, and 1 for those who have never tried it. For implementers of the CSA practice, it was possible to measure indicators related to decision-making, control over income generated, participation in and perceived changes of labor, perceived benefits, and knowledge, skills, and interest of the CSA practice. For the non-implementers, it was possible to measure knowledge, skills and constraints to implementing the CSA practice. For the previous implementers, we believe it will be possible to measure indicators related to decision-making and the choice to stop using the practice. In Table 3 we summarize only the recommended indicators, however, a pre-survey sample test should be carried out to determine which indicators are viable for any given study.

Table 3 The most comprehensible gender indicators from our study

GOAL	M&L TRACKING OBJECTIVES	INDICATOR AT THE INDIVIDUAL LEVEL
Gender equality in decision-making (Current and previous users of the CSA practice)	Track women's and men's participation in decision-making of CSA practices	The proportion of women and men that participate in the decision to use the CSA practice
		The proportion of women and men that participate in the decision to stop using a CSA practice
Gender equality in control over economic benefits (Users of the CSA practice)	Track women's and men's control over the income earned from the practice	The proportion of women and men that participate in the decision over how to use the income earned from the CSA practice
Understand how gendered labor requirements of the practice relate to its uptake/adoption (Users of the CSA practice)	Identify women's and men's labor participation in implementing the CSA practice	The proportion of women and men that participate (provide labor) in the implementation of the CSA practice
	Track women's and men's perceptions of changes in labor due to the CSA practice	The proportion of women and men who perceive that the CSA practice increases, reduces or does not affect labor time
Gender equality in benefits from agricultural innovations (Users of the CSA practice)	Identify women's and men's perception of the different benefits gained from the CSA practice	The proportion of women and men who perceive that the CSA practice generates income
		The proportion of women and men who perceive that the CSA practice increases access to food
		The proportion of women and men who perceive that the CSA practice improves food security
		The proportion of women and men who perceive that the CSA practice helps with adaptation to climate variability

GOAL	M&L TRACKING OBJECTIVES	INDICATOR AT THE INDIVIDUAL LEVEL
Gender-equitable targeting of agricultural innovations (Current, previous and non-users of the CSA practice)	Identify men's and women's awareness, knowledge, initiative and interest in regard to the CSA practice	The proportion of women and men that are aware of the CSA practice (non-users)
		The proportion of women and men that know how to implement the CSA practice (current & non-users)
		The proportion of women and men that have tried to implement the CSA practice before (previous users)
		The proportion of women and men that want more information about the CSA practice (current & non-users)

3.2 Challenge 2: survey instrument design and wording

The design of the survey questionnaire has a strong effect on how both men and women from across different social groups will respond to the survey, as well as what the researchers will be able to gain from the information collected. There are particular challenges to dealing with the instrument design and wording for a mobile phone survey, as there is no ability to control the environment or assist the participants while they respond to the survey. As one participant explained, *"Face to face, you can ask again about the questions. But by mobile phone, the majority of the time it is a machine, and sometimes you do not understand the question that was asked."*(Man, Popayan, April 2017). While it is possible for participants to listen to questions again on the cellphone, they cannot be formulated differently or explained in more detail.

The location and situation in which the interviewee answers the survey may be less than ideal, and without a physical interviewer present, there is little ability to correct for questionnaire-based confusion or problems. Thus, the response rate is likely to be lower with mobile phone surveys compared to in person interviews since participants are more likely to opt out or not finish the survey. As such it is important that the survey is designed to be as clear and short as possible: that the interviewees understand the questions and answer choices, that they do not need additional clarification, and that they can answer quickly and concisely without needing to justify or explain themselves. Obviously, there are many challenges involved, particularly with asking questions about complex concepts (such as dynamics and changes in intra-household relations) to participants that are unfamiliar with mobile phone surveys.

For our study, all of these difficulties played a role and the most critical challenge attached to these difficulties was orienting the wording and formatting of the questionnaire. The wording and formatting of the survey instrument need to ensure that the interviewees can understand the questions, feel comfortable, and provide information of at least the minimum quality needed. All while preferably also taking a short amount of time, as participants noted at times being too busy to finish answering the survey. As such, a decision must be made on the most important questions to ask and how the survey can be oriented around a few, quick, and easy questions.

For collecting responses pertinent to gender analysis, it is also very important to consider what is implied by any social concepts used. For example, for our project, we asked about 'participation in decision-making', which is a concept that is subjective to different perspectives (Ambler et al. 2017). Perhaps in regards to decision-making about a practice, a couple discussed a decision beforehand, but the man made the final decision at the time of implementation. Here the man and woman may have different views on if the decision was made solely by the man or made jointly by the couple. Likewise, the implied meaning of the concept will be affected by the type of social concept it is and the type of information that the researchers are seeking. In regards to questions about social concepts, it is recommended to be more explicit in what information is being sought by the question.

In tables 4 and 5, we provide specific recommendations on question wording and structuring based on our experiences in creating, piloting, and implementing the survey. We then provide specific examples of questions which were worded badly and dropped from our survey alongside the type of wording which we would recommend instead.

Table 4 Recommendation and advise on structuring questions for mobile phone surveys

RECOMMENDATION	ADVISE AGAINST	SPECIFIC WORDS TO NOT USE
Ask for a concrete item or action	Asking about a process or an explanation	"How"
Ask about just one concept	Joining and linking questions through conjunctions	"And", "or", "but", "just"
Privilege "yes" / "no" answers	Asking for numbers or asking them to choose between various long phrase answers	"How many," as in with hectares, months, years, units of production

Table 5 Non-recommended and recommended questions

NON-RECOMMENDED QUESTIONS/ANSWERS	RECOMMENDED QUESTIONS/ANSWERS
• **How many** crops do you have for consumption **and** for selling? • **How many** crops do you have **just** for consumption? **Just** for selling? • **For how many months** has the home garden supported the household with a greater provision of food? • Did you participate in **making the decision** to implement the home garden? 1) Yes, alone 2) Yes, joint with partner/spouse 3) Yes, joint with others 4) No, other person 5) No, other person outside the household.	• Has the home garden allowed for **more** variety of products for **your household consumption**? 1) Yes 2) No • Did you **personally** do **any work** related with the home garden? 1) Yes 2) No • Did you **personally participate** in **making the decision** to implement the home garden? 1) Yes 2) No • Have you heard about the home garden? 1) Yes 2) No • Do you know how to implement a home garden? 1) Yes 2) No

A trade-off with using the recommended questions and answers from column 2 of Table 5 is that they do not gather additional information which could be obtained through other kinds of questions such as understanding the decision-making process (e.g. with whom the decision is made or how the person participates in the decision-making). We also learned about the need to carefully consider the phrasing of questions/indicators based on whether the information should be collected at the individual or the household level. For example, at the individual level: 'Have you personally heard about sustainable home gardens?' And at household level: 'Has this sustainable home garden been implemented before in your household?'

It is important to ensure that the survey instrument is phrased and recorded to be as understandable to the study site population as possible (taking into consideration dialect, word choice, expressions and accent). Furthermore, we recommend carrying

out a pre-survey pilot test to resolve unforeseen complications with the instrument design, taking care to sample across genders and various groups and backgrounds. Finally, it is important to have regular meetings between the researchers, technicians and participants throughout the process in order to receive and address feedback.

3.3 Challenge 3: the survey call response rates of men and women

Another important challenge was accounting for variables of mobile phone use which affect the gendered rates of response to the survey. In our study site, the mobile phone can have different uses within the household; we identified two main situations in our study site to exemplify this issue (but they may not be present in other sites and/or other sites may experience other specific issues related to this topic).

The first is that the mobile phone often fulfilled a social function within the household, namely that of keeping in touch with friends and families. In this regard, the mobile phone is then treated similarly to a landline and left at the house in a place where the mobile signal is stronger. Within our study site, the women also tend to stay at home during the day to perform domestic work, while the men leave to work in agricultural plots. As such, the women in the first situation had more access to the mobile phone. The best times to call for them were after certain responsibilities were fulfilled, such as after preparing the lunch. On the other hand, it was found that in order to reach the men, the best times to call would be in the evening and over the weekend, when they were not away working in the fields.

"The mobile phone is managed by my daughter and wife. I don't typically have the mobile phone, since I'm not usually at home. [How then can we communicate with you?] It would be best if you call them (the wife or daughter), and then they can give me the information." (Male interviewee, Popayan, April 2017)

For the second situation, in contrast, it was more difficult to reach the women in some households. This could occur for various reasons, including a 'work-oriented' purpose, whereby the male spouse would take the mobile phone with him to the fields, and the wife would perform her work at the house without mobile phone access until the man had returned. Or this would occur because there is no signal in the house and the cellphone calls must be taken outside.

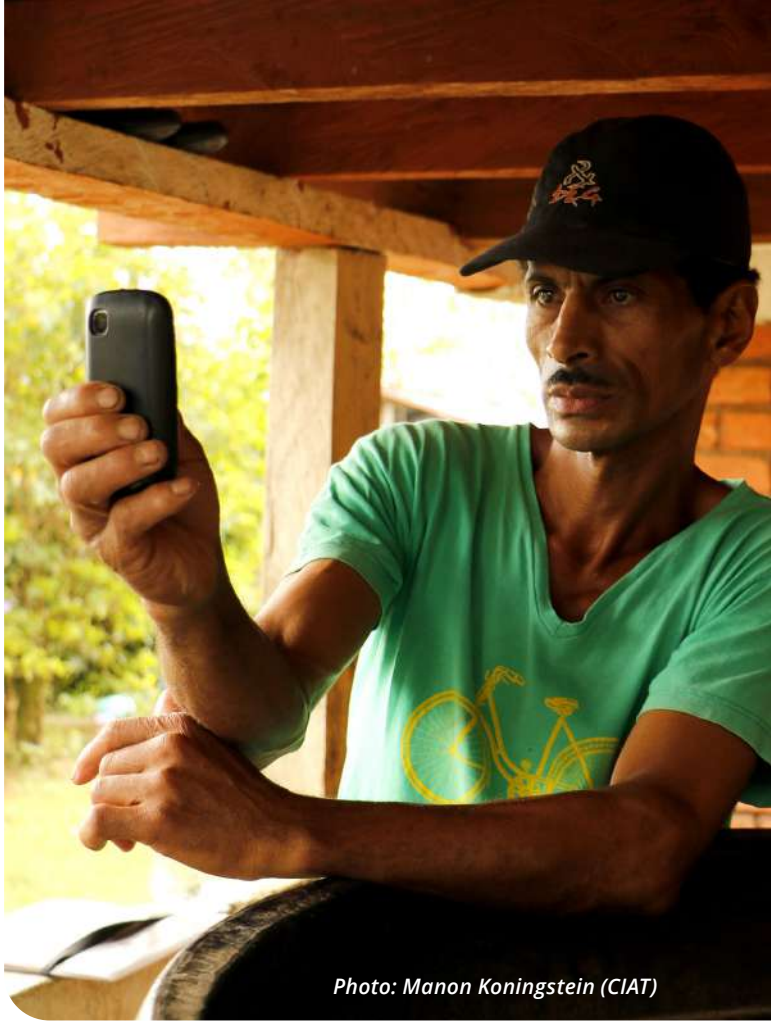


Photo: Manon Koningstein (CIAT)

"It is difficult, because here there is no signal and the mobile phone is always with [my husband]. With me there is communication practically only if you arrive here [to the house]." (Women farmer, Popayan, April 2017).

In our study we found that because mobile phone use was gendered and time constrained, it was difficult to guarantee that both men and women within each household could be reached equally. We became aware of such factors only during follow-up interviews and, as previously mentioned, our calling schedule was already constrained by mobile network access being most accessible during market visits. In part due to such difficulties, we were unable in the end to perform an intra-household survey through mobile phone use alone, as we could not gather answers from both the principal woman and man for each and every household. As such, we supplemented these calls with in-person interviews.

3.4 Challenge 4: identifying gendered practices and responses

Without an interviewer present, it is impossible to know who is answering the questions. Knowing the participant is who they are, is crucially important when collecting sex-disaggregated data to perform gender analysis. For our study, at the beginning of each mobile phone survey call, the sex of the person was asked. However, because the questions were about the use of a sustainable home garden, which is considered a female-oriented activity, some male respondents would then pass the mobile phones to their wives. We learned about this phenomenon during the follow-up in-person interviews, where the male interviewees revealed that their wives had actually answered the mobile phone survey's questions. With a practice that is male-oriented, the opposite case would be likely to occur, a situation which could lead to women's voices being mistaken and remaining invisible, possibly while the researchers remain unaware. This is a very important aspect of using mobile phones for gender work, because if we do not know the respondent's gender, we cannot have a gender M&L system. Furthermore, if the gender given is mistaken or false, our results, based on sex-disaggregated data, will be skewed.

Recommendations to tackle such a challenge include having the survey ask for the gender of the respondent at the beginning of each call, putting in a message to remind the respondent that only s/he should answer the questions and no one else (regardless of knowledge, responsibility, or experience about the practice), and/or including such a message in any pre-survey implementation workshops or communications materials.

3.5 Challenge 5: identifying potential mobile phone sampling gaps

The final important challenge we faced was to identify where sampling gaps may occur because of the use of mobile phones to implement the survey. In our study, we found that the two main variables which caused sampling gaps were ICT literacy and mobile network access issues. These are not necessarily challenges related to measuring gender indicators, but are also important considerations for other types of indicators (they may be gender issues if ICT literacy and/or mobile network access are gendered).

First, we found that it is important to identify sub-groups with low ICT literacy within the sampled population. With our study in particular, the elderly population (also found to have a low education level) was identified to have the most issues with ICT literacy. According to the data of the Gender survey of 2014, approximately 29.1% of the principal men and women identified for each household were classified as elderly, 60 years old or older. There was also a high correlation between elderly status and low levels of education; of the elderly in the sample, 98.2% had only primary-level or no education. Futhermore, only 34.8% of the elderly owned a mobile phone. This signaled that a fairly high proportion of the population may be unable to or have difficulties to answer the mobile phone survey due to ICT literacy and subsequent ownership issues. We found two different scenarios were present in regards to this phenomenon:

1. The first scenario is that the household does not even own a mobile phone:

"No, we do not have mobile phones. Neither of us. Our sons, they have them. It's that we do not know how to manage the mobile phones, in other words, to be frank" (Man, Popayan, April 2017).

2. The second scenario is that the household does own a mobile phone, but the principal man and/or women need assistance to use it. In this second situation, the intended interviewees often use the aid of family members to help them take the survey. Such is the example of one man who related that his wife was the one who used the mobile phone to help him answer the survey questionnaire, as she knew how to use it. His wife explained:

"Yes, I put the loudspeaker on. When the questions were asked, I asked him what was the number I should press. He told me 1, 2, or 3. I pressed the number, but he was the one who told me which to press" (Woman, Popayan, April 2017).

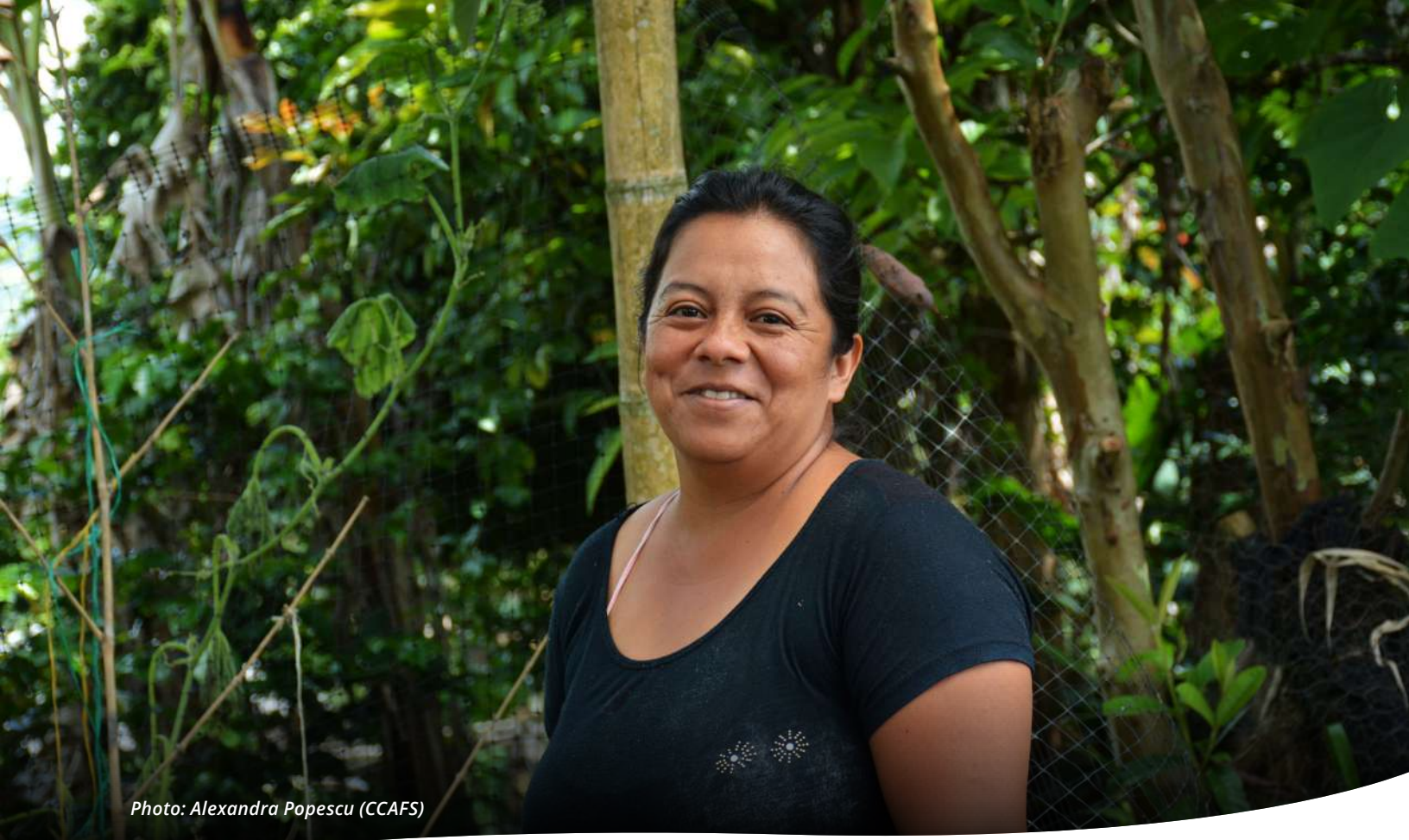


Photo: Alexandra Popescu (CCAFS)

In both situations, in-person interviews would need to be conducted. People from this group told us that they preferred in-person interviews, as they felt more comfortable. It is also possible that the influence of the family member assisting the interviewee may bias their responses. Holding pre-survey workshops is another possible strategy to combat the second situation by teaching ICT literacy skills and preparing the sampled population for the survey. Some interviewees mentioned even if they knew how to use the mobile phone, that they felt, at first, fear or nervousness about taking the mobile phone survey. The workshops are an opportunity to help them become accustomed to the survey format, as well as an opportunity to help relieve other potential concerns.

As well as low ICT literacy, mobile network access may be another obstacle. As such, identifying mobile network access in the study site is another key activity to carry out before the mobile phone survey implementation. For our field site, many of the households did not have access to the mobile network. As such, one of our alternative strategies was to call the participants on the days and times that they were most likely to go to the market, which had much stronger signal access. As previously mentioned in challenge 2, however, such a strategy might have conflicted with other time-dependent gendered mobile phone access considerations. As such, for those participants that we were unable to reach, we conducted in-person interviews. Identifying the mobile network coverage of the study site is a necessary consideration for the survey implementation plan and in the case of the inability to reach all of the sampled population, it is necessary to identify alternate strategies. In other sites, electricity for charging mobile phones may also be an issue; however, we did not identify in this pilot this difficulty.

4 Discussion

The challenges of the study were mainly caused by a mixture of effects from two factors: the effects of not having an interviewer physically present and the effects of using mobile phones as the survey implementation tool. Even though we concentrated our reflection on the use of mobile phones as a research tool, we faced challenges that also could be extend to face-to-face interviews when collecting sex disaggregated data, such as implementing an appropriate sampling technique or wording questions correctly in a given context.

Going beyond the present challenges as independent factors, we now discuss their effects on the monitoring system as a whole. The mobile phone survey can track sex-disaggregated responses. We were able to fulfill the minimum standards for collecting sex-disaggregated data, because in the end it was possible to collect information *about* women and men *from their own perspectives*. From this, we were able to measure indicators, through the sex-disaggregated data we collected, which corresponded to the objectives of the monitoring system. However, these indicators do not explain why gender inequalities exist, directly measure women's empowerment or measure changes in women's empowerment.

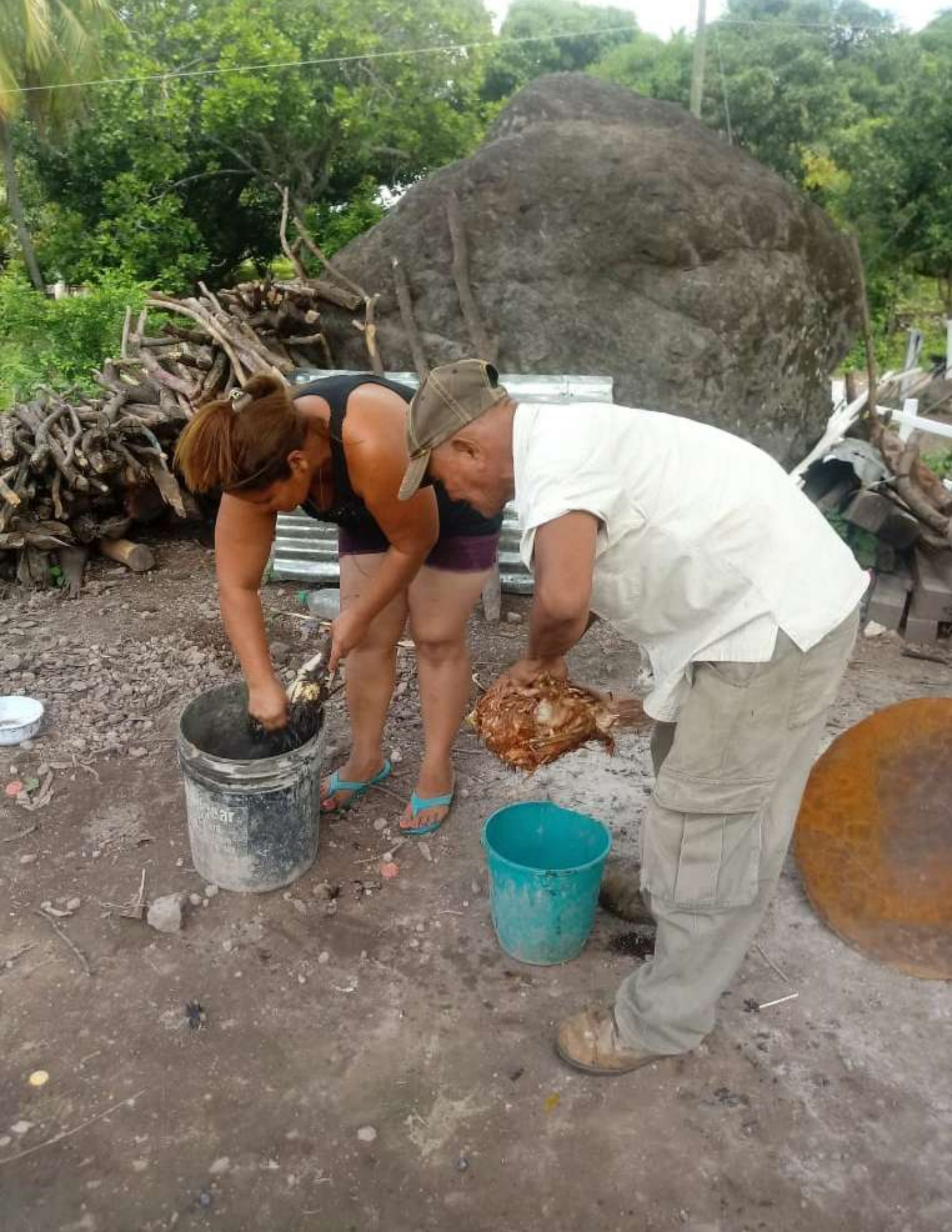
Furthermore, it was difficult to ensure that both the principal woman and man from each and every one of the households were reached. While analyzing the data, it also proved difficult to identify, with a high degree of confidence, to which household each interviewee belonged. As such, an intra-household unit of analysis was not obtainable. Instead, we ended by having sex-disaggregated data from the communities at an individual level of analysis. Therefore, we cannot measure variables at the household level, such as the number of households in which women make decisions on the CSA practice over the total number of households that use the practice. However, it is possible to measure variables at the individual unit. For example:

Possible:

$$\frac{\text{\# of women who make decisions}}{\text{total \# of women interviewed}}$$

Not Possible:

$$\frac{\text{\# of households with women decisionmakers}}{\text{total \# of households which use practice}}$$



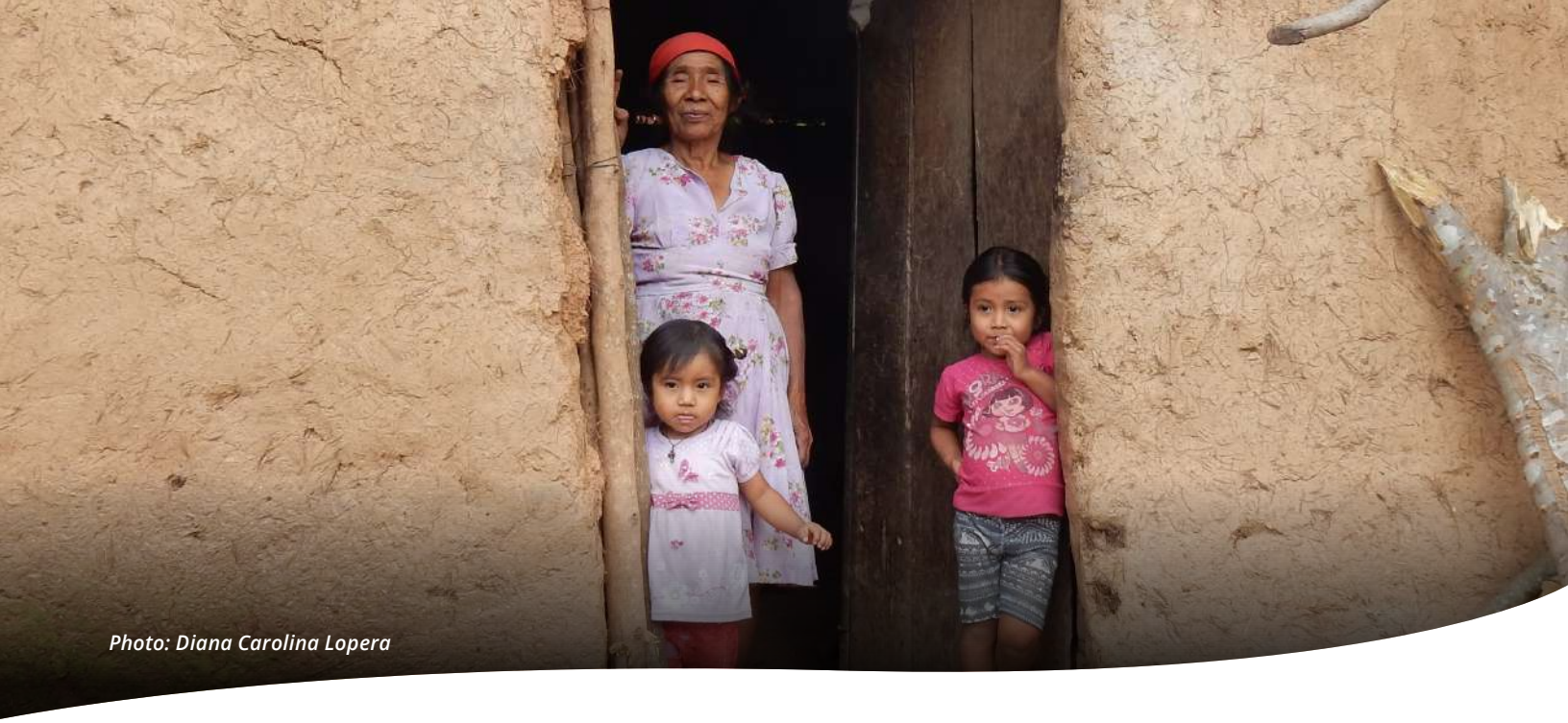


Photo: Diana Carolina Lopera

5 Conclusion

It is important to consider not only the benefits, but also the challenges of using cellphones to collect data for monitoring gender indicators. Some of the benefits of using cellphones to collect survey data include the following three topics. First, cellphone use provides crucial benefits by reducing key implementation concerns of time and budget, especially important factors when the project requires multiple interviews to be carried out with the same participants (Dillon 2010; Jarvis et al. 2015). Second, mobile phone surveys are able to eliminate the potential of enumerator-related bias. Social characteristics of the enumerator (e.g. place of origin, age, gender, ethnicity and institutional affiliation) and their actions (e.g. facial expressions) during the interview can influence the answers of the interviewee. Third, another benefit to consider is the ability for local teams to implement this survey. A mobile phone survey requires a high level of knowledge of the local context, therefore, it is recommended to be implemented by technicians and researchers that work permanently in the site.

We faced five challenges, which stem from the intricacies of performing a monitoring survey through the use of mobile phones, of which we were able to confront, analyze, and learn from. The specific attributes of each monitoring study should be considered, planned, and re-evaluated by taking into account how such intricacies may affect the study. Such challenges will affect the overall framework that can or should be utilized, the type of sampling and unit of analysis that can be employed, and the gender indicators that can be measured. Furthermore, the benefits, as well as the difficulties, of this type of survey implementation should be weighed in regards to the specific study being carried out.

We can remark from this first site-specific experience that it is possible to implement a gender-sensitive M&L system, using mobile phones as the main research tool for CSA adaptation projects, as long as the aforementioned challenges and recommendations are taken into account. However, since this reflection is from the experience of one case, further pilot tests should be implemented to inform more confident assumptions on the use of ICT-supported automated phone-based system for gender work.

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Headquarters and Regional Office for Latin America and the Caribbean

Km 17 Recta Cali–Palmira CP 763537
Apartado Aéreo 6713
Cali, Colombia
Phone: +57 2 4450000
Fax: +57 2 4450073
General e-mail: ciat@cgiar.org

CONTACT
Ruben Echeverría, Director General

Carolina Navarrete, Regional Director
c.navarrete@cgiar.org

Regional Office for Central America

Planes de Altamira,
de Pizza Hut Villa Fontana 1 cuadra al oeste
Edificio CAR III, 4to. Piso
Apartado Postal LM-172
Managua, Nicaragua
Phone: +505 2 2993011 / 22993056

CONTACT
Jenny Wiegel, Regional Coordinator
j.wiegel@cgiar.org

Regional Office for Africa

c/o ICIPE
Duduville Campus,
Off Kasarani Road
P.O. Box 823-00621
Nairobi, Kenya
Phone: +254 0709134000
Fax: +254 20 8632001

CONTACT
Debisi Araba, Regional Director
a.araba@cgiar.org

Regional Office for Asia

c/o Agricultural Genetics Institute (Vien Di Truyen Nong Nghiep),
Vietnam Academy of Agricultural Sciences (VAAS),
Pham Van Dong Street, Tu Liem
(opposite the Ministry of Security – Doi dien voi Bo Cong An)
Hanoi, Vietnam
Phone: +844 37576969

CONTACT
Dindo Campilan, Regional Director
d.campilan@cgiar.org

Alliance

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